WHAT IS CLAIMED IS:

1. A method for inducing nuclear fusion, the method comprising:

positioning a bubble at a location within a liquid filled vessel, the bubble containing atomic nuclei;

generating a positive acoustic pulse in the liquid, the acoustic pulse surrounding and converging toward the bubble; and,

allowing the acoustic pulse to compress the bubble to provide energy to the atomic nuclei and to thereby induce nuclear fusion of at least two of the atomic nuclei.

2. A method according to claim 1 wherein compressing the bubble comprises increasing a temperature and pressure experienced by the atomic nuclei through substantially adiabatic compression.

3. A method according to any one of claims 1 to 2 wherein the acoustic pulse grows in amplitude as it converges toward the location.

4. A method according to any one of claims 1 to 3, wherein the liquid filled vessel is substantially spherical and positioning the bubble at the location comprises positioning the bubble substantially close to the center of the spherical liquid filled vessel.

5. A method according to any one of claims 1 to 4 wherein generating the positive acoustic pulse in the liquid comprises generating a spherically symmetric acoustic pulse that converges spherically toward the location of the bubble.

6. A method according to any one of claims 1 to 5 wherein the bubble is gaseous.

7. A method according to any one of claims 1 to 6 wherein the bubble is buoyant and positioning the bubble at the location comprises inserting the bubble into the vessel and allowing the bubble to rise to the location.

8. A method according to claim 7 comprising increasing a size of the bubble immediately prior to compressing the bubble.

9. A method according to claim 8 wherein increasing the size of the bubble comprises decreasing a pressure of the liquid.

10. A method according to any one of claims 1 to 6 comprising creating fluid flow of the liquid between one side of the vessel and an opposing side of the vessel.

11. A method according to claim 10 wherein positioning the bubble at the location comprises inserting the bubble into the fluid flow and allowing the bubble to be carried by the fluid flow to the location.

12. A method according to any one of claims 1 to 11 wherein the bubble is surrounded by a micro-balloon.

13. A method according to any one of claims 1 to 12 wherein the atomic nuclei comprise one or more of: deuterium nuclei; tritium nuclei; and nuclei of helium isotopes.

14. A method according to any one of claims 1 to 13 wherein the liquid comprises lithium.

15. A method according to any one of claims 1 to 14 wherein generating a positive acoustic pulse comprises striking an exterior of the vessel.

16. A method according to claim 15 wherein the vessel is spherical in shape and striking the exterior of the vessel comprises striking the vessel at a plurality of spherically symmetric locations.

17. A method according to claim 16 wherein striking the vessel at the plurality of spherically symmetric locations comprises striking the vessel substantially simultaneously at the plurality of locations.

18. A method according to any one of claims 16 to 17 wherein striking the vessel at the plurality of spherically symmetric locations comprises striking the vessel with a substantially identical kinetic energy at each location.

19. A method according to any one of claims 16 to 18 wherein striking the vessel at the plurality of spherically symmetric locations comprises providing a piston adjacent to each of the plurality of locations and moving each piston toward the vessel until the piston impacts the vessel at its corresponding location.

20. A method according to claim 19 wherein striking the vessel substantially simultaneously at the plurality of locations comprises measuring a position of the piston corresponding to each location as the piston moves toward the vessel and, based on the measured position of the piston, controlling movement of the piston.

21. A method according to claim 19 wherein striking the vessel with the substantially identical kinetic energy at each location

comprises measuring a position of the piston corresponding to each location as the piston moves toward the vessel and, based on the measured position of the piston, controlling movement of the piston.

22. A method according to claim 16 comprising measuring a measured position of the bubble.

23. A method according to claim 22 wherein measuring the measured position of the bubble comprises transmitting and receiving one or more ultrasonic signals.

24. A method according to any one of claims 22 to 23 wherein positioning the bubble at the location comprises creating one or more flow patterns in the liquid and determining an amount of each flow pattern based at least in part the measured position of the bubble.

25. A method according to any one of claims 22 to 23 wherein striking the vessel at the plurality of spherically symmetric locations comprises measuring a position of the piston corresponding to each location as the piston moves towards the vessel and, based on the measured position of the piston and the measured position of the bubble, controlling movement of the piston.

26. A method according to any one of claims 20, 21 and 25 wherein controlling movement of the piston comprises controlling an amount of current that flows through loops of a coil that surrounds the piston.

27. A method according to any one of claims 19 to 22 wherein moving each piston toward the vessel comprises actuating the piston with compressed gas.

28. A method according to claim 27 wherein the compressed gas is at least partially compressed by an acoustic pulse in the liquid.

29. A method according to any one of claims 1 to 28 wherein the nuclear fusion of the at least two atomic nuclei produces heat energy and the method comprises absorbing the heat energy in the liquid.

30. A method according to claim 29 comprising extracting at least a portion of the heat energy absorbed in the liquid by converting at least a portion of the heat energy to electrical energy.

31. A method according to claim 30 wherein converting at least a portion of the heat energy to electrical energy comprises actuating a turbine using the heat energy.

32. A nuclear fusion reactor comprising:

a vessel filled with liquid;

a bubble containing atomic nuclei, the bubble positionable at a location within the vessel; and

a plurality of pistons positioned outside of the vessel, the pistons actuable to strike an outer surface of the vessel and to thereby generate a positive acoustic pulse in the liquid which surrounds and converges toward the bubble to compress the bubble;

wherein compression of the bubble provides energy to the atomic nuclei and thereby induces nuclear fusion of at least two of the atomic nuclei.

33. A reactor according to claim 32 wherein compression of the bubble is substantially adiabatic to increase a temperature and pressure experienced by the atomic nuclei.

34. A reactor according to any one of claims 32 to 33 wherein the acoustic pulse grows in amplitude as it converges toward the location.

35. A reactor according to any one of claims 32 to 34, wherein the liquid filled vessel is substantially spherical and the location is the center of the spherical liquid filled vessel.

36. A reactor according to any one of claims 32 to 35 wherein the acoustic pulse is a spherically symmetric acoustic pulse that converges spherically toward the location of the bubble.

37. A reactor according to any one of claims 32 to 36 wherein the bubble is gaseous.

38. A reactor according to any one of claims 32 to 37 wherein the bubble is buoyant and is positionable by rising through the liquid to the location.

39. A reactor according to claim 38 comprising means for decreasing a pressure of the liquid and increasing a size of the bubble when the bubble is at the location.

40. A reactor according to any one of claims 32 to 37 comprising a fluid flow circuit for creating a fluid flow of the liquid between one side of the vessel and an opposing side of the vessel, wherein the bubble is positionable by traveling in the fluid flow to the location.

41. A reactor according to any one of claims 32 to 40 wherein the bubble is surrounded by a micro-balloon.

42. A reactor according to any one of claims 32 to 41 wherein the atomic nuclei comprise one or more of: deuterium nuclei; tritium nuclei; and nuclei of helium isotopes.

43. A reactor according to any one of claims 32 to 42 wherein the liquid comprises lithium.

44. A reactor according to any one of claims 32 to 43 comprising one or more bubble position detectors positioned on an inner wall of the vessel for measuring a measured position of the bubble.

45. A reactor according to claim 44 wherein the bubble position detectors comprise ultrasonic position detectors.

46. A reactor according to any one of claims 44 to 45 comprising one or more pairs of jets, one of each pair of jets located on opposing sides of the inner wall of the vessel for creating a corresponding flow of the liquid.

47. A reactor according to claim 46 comprising a controller connected to determine an amount of each flow of the liquid based at least in part the measured position of the bubble.

48. A reactor according to any one of claims 32 to 47 wherein the vessel is spherical and the plurality of pistons are located to strike the vessel at a corresponding plurality of spherically symmetric locations.

49. A reactor according to claim 48 wherein each of the plurality of pistons is sized and actuated to strike the vessel with a substantially identical kinetic energy.

50. A reactor according to any one of claims 48 to 49 comprising a plurality of position sensors, each position sensor associated with a corresponding piston for measuring a position thereof.

51. A reactor according to claim 50 comprising a controller connected to receive a measured piston position from at least one of the position sensors and, based at least in part on the measured piston position, to control movement of the corresponding piston.

52. A reactor according to claim 51 wherein the controller is connected to receive the measured piston position and the measured position of the bubble and, based at least in part on the measured piston position and the measured position of the bubble, to control movement of the corresponding piston.

53. A reactor according to any one of claims 51 to 52 comprising a magnet attached to each piston and a coil surrounding each piston, the controller connected to control a current induced in the coil by the movement of the magnet therethrough and to thereby control movement of the associated piston.

54. A reactor according to any one of claims 32 to 53 wherein the pistons are actuated by compressed gas.

55. A reactor according to claim 54 wherein the compressed gas is at least partially compressed by an acoustic pulse in the liquid.

56. A reactor according to any one of claims 32 to 55 wherein the nuclear fusion of the at least two atomic nuclei produces heat energy that is absorbed in the liquid.

57. A reactor according to claim 56 comprising a heat exchanger in fluid communication with the vessel for extracting at least a portion of the heat energy absorbed in the liquid by converting at least a portion of the heat energy to electrical energy.